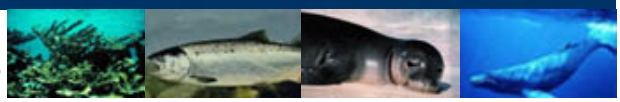
NOAA Fisheries
Office of Protected Resources



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Pacific Eulachon/Smelt *(Thaleichthys pacificus)*

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Status
ESA Threatened - Southern DPS

Taxonomy
Kingdom: Animalia
Phylum: Chordata
Class: Actinopterygii
Order: Osmeriformes
Family: Osmeridae
Genus: *Thaleichthys*
Species: *pacificus*

Species Description
Weight: 2.5 ounces (70 g)

Length: 8.5 inches (21.5 cm)

Appearance: brown to blue on their backs and on top of their heads, lighter to silvery white on the sides, and white belly; large canine teeth on the bone in the roof of the mouth ("vomer") and 18 to 23 rays in their anal fin and a sickle-shaped "adipose fin"

Lifespan: unknown

Diet: plankton

Behavior: spend 3-5 years in saltwater before returning to freshwater to spawn

Did You Know?

- The common name "candlefish" derives from the fact that it is so fat during spawning, with up to 15% of total body weight in fat that, when caught, dried, and strung on a wick, it could be burned like a candle.
- The name "eulachon" is from the Chinookan language.

Eulachon (commonly called smelt, candlefish, or hooligan) are a small, anadromous fish from the eastern Pacific Ocean. They are distinguished by large canine teeth on the bone in the roof of the mouth ("vomer") and 18 to 23 rays in their anal fin. Like Pacific salmon they have an "adipose fin"; it is sickle-shaped. The paired fins are longer in males than in females. All fins have well-developed breeding tubercles (raised tissue "bumps") in ripe males, but these are poorly developed or absent in females. As adults, they are brown to blue on their backs and on top of their heads, lighter to silvery white on the sides, and white on the ventral surface. Their backs may have fine, sparse speckling. They feed on plankton but only while at sea.

Eulachon typically spend 3 to 5 years in saltwater before returning to freshwater to spawn from late winter through mid spring. During spawning, males have a distinctly raised ridge along the middle of their bodies. Eggs are fertilized in the water column. After fertilization, the eggs sink and adhere to the river bottom, typically in areas of gravel and coarse sand. Most eulachon adults die after spawning. Eulachon eggs hatch in 20 to 40 days. The larvae are then carried downstream and are dispersed by estuarine and ocean currents shortly after hatching. Juvenile eulachon move from shallow nearshore areas to mid-depth areas. Within the Columbia River Basin, the major and most consistent spawning runs occur in the mainstem of the Columbia River as far upstream as the Bonneville Dam, and in the Cowlitz River.

Habitat
Eulachon occur in nearshore ocean waters and to 1,000 feet (300 m) in depth, except for the brief spawning runs into their natal (birth) streams. Spawning grounds are typically in the lower reaches of larger snowmelt-fed rivers with water temperatures ranging from 39 to 50°F (4 to 10°C). Spawning occurs over sand or coarse gravel substrates.

Critical Habitat
In Octoebr 2011, NMFS designated critical habitat for the threatened southern DPS (76 FR 65323). The proposed critical habitat (76 FR 515) was published in January 2011.

Distribution


Eulachon Range Map
(click for larger view PDF)

Eulachon are endemic to the eastern Pacific Ocean, ranging from northern California to southwest Alaska and into the southeastern Bering Sea. In the continental United States, most eulachon originate in the Columbia River Basin. Other areas in the United States where eulachon have been documented include the Sacramento River, Russian River, Humboldt Bay and several nearby smaller coastal rivers (e.g., Mad River), and the Klamath River in California; the Rogue River and Umpqua Rivers in Oregon; and infrequently in coastal rivers and tributaries to Puget Sound, Washington.

Population Trends

Eulachon abundance exhibits considerable year-to-year variability. However, nearly all spawning runs from California to southeastern Alaska have declined in the past 20 years, especially since the mid 1990s. From 1938 to 1992, the median commercial catch of eulachon in the Columbia River was approximately 2 million pounds (900,000 kg) but from 1993 to 2006, the median catch had declined to approximately 43,000 pounds (19,500 kg), representing a nearly 98% reduction in catch from the prior period. Eulachon returns in the Fraser River and other British Columbia rivers similarly suffered severe declines in the mid-1990s and, despite increased returns during 2001 to 2003, presently remain at very low levels. The populations in the Klamath River, Mad River, Redwood Creek, and Sacramento River are likely "extirpated", or nearly so.

Threats

Habitat loss and degradation threaten eulachon, particularly in the Columbia River basin. Hydroelectric dams block access to historical eulachon spawning grounds and affect the quality of spawning substrates through flow management, altered delivery of coarse sediments, and siltation. The release of fine sediments from behind a U.S. Army Corps of Engineers sediment retention structure on the Toutle River has been negatively correlated with Cowlitz River eulachon returns 3 to 4 years later and is thus implicated in harming eulachon in this river system, though the exact cause of the effect is undetermined. Dredging activities in the Cowlitz and Columbia rivers during spawning runs may entrain and kill fish or otherwise result in decreased spawning success.

Eulachon have been shown to carry high levels of chemical pollutants, and although it has not been demonstrated that high contaminant loads in eulachon result in increased mortality or reduced reproductive success, such effects have been shown in other fish species. Eulachon harvest has been curtailed significantly in response to population declines. However, existing regulatory mechanisms may be inadequate to recover eulachon stocks.

Global climate change may threaten eulachon, particularly in the southern portion of its range where ocean warming trends may be the most pronounced and may alter prey, spawning, and rearing success.

Conservation Efforts

Conservation efforts include fishing restrictions and habitat improvements targeted to improve the status of eulachon, salmon, and other native species in Pacific Northwest streams.

Regulatory Overview

In 1999, NOAA Fisheries was petitioned to list Columbia River eulachon under the ESA. In November 1999, NMFS issued a finding that the petition did not present substantial scientific information indicating the petitioned action may be warranted (64 FR 66601; November 29, 1999).

On November 8, 2007, NMFS received another petition to list southern eulachon under the ESA. The petition sought delineation of a southern eulachon "Distinct Population Segment" (DPS) extending from the U.S.-Canada border south to include populations in Washington, Oregon, and California. In March 2008, NMFS determined that the petition presented substantial scientific and commercial information indicating the petitioned action may be warranted, and initiated a status review.

In March 2010, NMFS listed the Southern DPS of eulachon as threatened under the ESA.

Key Documents

(All documents are in PDF format.)

Title	*Federal Register*	Date
Notice of intent to prepare a recovery plan for the Pacific Eulachon	78 FR 40104	07/03/2013
Final Rule to Designate Critical Habitat	76 FR 65323	10/20/2011
Proposed Rule to Designate Critical Habitat	76 FR 515	01/05/2011
Final Rule to List the Southern DPS as Threatened Under the ESA	75 FR 13012	03/18/2010
Proposed Rule to List the Southern DPS as Threatened Under the ESA	74 FR 10857	03/13/2009
Positive 90-Day Finding on a Petition to List Pacific Eulachon under the Endangered Species Act	73 FR 13185	03/12/2008
1999 Negative 90-Day Finding on a Petition to List Pacific Eulachon under the Endangered Species Act	64 FR 66601	11/29/1999

More Information

- NMFS Northwest Regional Office Pacific Eulachon Information

Updated: August 6, 2013